

THAT WHICH IS CLAIMED:

1. A cellular radiotelephone system comprising:

a plurality of time division multiple access (TDMA) cellular radiotelephone base stations, each of which serves a cellular radiotelephone cell and communicates radiotelephone communications with cellular radiotelephones using radiotelephone communications signals communicated over a like plurality of sequential time slots;

time-slot synchronizing means for synchronizing said like plurality of sequential time slots among said plurality of base stations, such that a corresponding time slot for each base station is used concurrently, to produce synchronized time slots among said plurality of base stations; and

time-reuse partitioning means for allocating cellular radiotelephone frequencies among said plurality of base stations in a first one of said synchronized time slots according to a first frequency allocation system and for allocating cellular radiotelephone frequencies among said plurality of base stations in a second one of said synchronized time slots according to a second frequency allocation system different from said first frequency allocation system.

2. A system according to Claim 1 wherein said first frequency allocation system is one of a first adaptive channel allocation system, a first frequency reuse system, a first frequency reuse partitioning system and a first fixed frequency reuse system, and wherein said second frequency allocation system is one of a second adaptive channel allocation system, a second frequency reuse system, a second frequency reuse partitioning system and a second fixed frequency reuse system.

3. A system according to Claim 1:

wherein said first frequency allocation has a number of subscribers; and

5 wherein said time-reuse partitioning means further comprises means responsive to said number of subscribers of said first frequency allocation system for allocating cellular radiotelephone frequencies among said plurality of base stations according to said first frequency allocation system in a third one of  
10 said synchronized time slots.

4. A system according to Claim 1 further comprising means for receiving a request for a service type from a cellular radiotelephone and wherein said time reuse partitioning means comprises means for  
5 allocating frequencies responsive to a received request for a service type.

5. A system according to Claim 4 wherein said service type comprises one of a digital speech service, a digital data service, a packet data service, a control message service, a facsimile service, an  
5 image service and a code division multiple access (CDMA) service.

6. A system according to Claim 1 wherein said time reuse partitioning means comprises means for allocating cellular radiotelephone frequencies from a first frequency pool in a first one of said  
5 synchronized time slots and for allocating cellular radiotelephone frequencies from a second frequency pool different from said first frequency reuse pool in a second one of said synchronized time slots.

7. A system according to Claim 6 further comprising means for receiving a request for a service type from a cellular radiotelephone served by one of

5 said plurality of base stations and wherein said time  
reuse partitioning means assigns said first  
synchronized time slot, corresponding to said first  
frequency reuse pool, to the cellular radiotelephone  
responsive to a request for a first service type and to  
10 said second time synchronized time slot, corresponding  
to said second frequency reuse pool, to the cellular  
radiotelephone responsive to a request for a second  
service type.

8. A system according to Claim 7:

wherein said first service type comprises  
digital voice service and said second service type  
comprises a packet data service; and

5 wherein said first frequency reuse pool  
comprises all available frequencies in the cellular  
radiotelephone system and said second frequency pool  
comprises frequencies unused in adjacent cells.

9. A system according to Claim 7 wherein  
said first service type comprises a wideband service  
and said second service type comprises a narrowband  
service; and

5 wherein said first frequency pool comprises a  
plurality of wide frequency bands and said second  
frequency pool comprises a plurality of narrow  
frequency bands.

10. A system according to Claim 9 wherein  
said wideband service comprises a high speed data  
service and wherein said narrow service comprises one  
of a digital voice service and a low speed digital data  
5 service.

11. A system according to Claim 9 wherein  
said wideband service comprises a code division  
multiple access (CDMA) service.

12. A cellular radiotelephone system comprising:

a plurality of code division multiple access (CDMA) cellular radiotelephone base stations for communicating with cellular radiotelephones on a plurality of frequencies using a plurality of spreading codes, each of said plurality of spreading codes having a period;

code synchronizing means for synchronizing said plurality of spreading codes among said plurality of base stations so that said periods of each of said plurality of spreading codes are concurrent, to produce synchronized spreading codes among said plurality of base stations; and

code-reuse partitioning means for allocating cellular radiotelephone frequencies among said plurality of base stations for a first one of said synchronized spreading codes according to a first frequency allocation system and for allocating frequencies among said plurality of base stations for a second one of said synchronized spreading codes according to a second frequency allocation system different from said first frequency allocation system.

13. A cellular radiotelephone system according to Claim 12 wherein said plurality of spreading codes is one of a plurality of direct-sequence-modulation codes, a plurality of frequency-hopping codes, and a plurality of combined frequency-hopping/direct-sequence-modulation codes.

14. A system according to Claim 12 wherein said first frequency allocation system is one of a first adaptive channel allocation system, a first frequency reuse system, a first frequency reuse partitioning system and a first fixed frequency reuse system, and wherein said second frequency allocation

system is one of a second adaptive channel allocation system, a second frequency reuse system, a second frequency reuse partitioning system and a second fixed  
10 frequency reuse system.

15. A system according to Claim 12:  
wherein said first frequency allocation has a number of subscribers; and  
wherein said code-reuse partitioning means  
5 further comprises means responsive to said number of subscribers of said first frequency allocation system for allocating cellular radiotelephone frequencies among said plurality of base stations according to said first frequency allocation system for a third one of  
10 said synchronized spreading codes.

16. A method for operating a plurality of time division multiple access cellular radiotelephone base stations, each of which communicates with cellular radiotelephones using a like plurality of sequential  
5 time slots, the method comprising:  
allocating cellular radiotelephone frequencies among said plurality of base stations according to a first frequency allocation system in a first one of said time slots and according to a second  
10 frequency allocation system different from said first frequency allocation system in a second one of said time slots.

17. A method according to Claim 16 wherein said step of allocating is preceded by a step of synchronizing said like plurality of sequential time slots among said plurality of base stations, such that  
5 a corresponding time slot for each base station is used concurrently, to produce synchronized time slots among said plurality of base stations.

18. A method according to Claim 17 wherein said step of allocating comprises a step of allocating cellular radiotelephone frequencies among said plurality of base stations according to one of a first adaptive channel allocation system, a first frequency reuse system, a first frequency reuse partitioning system and a first fixed frequency reuse system in said first one of said synchronized time slots and according to one of a one of a second adaptive channel allocation system, a second frequency reuse system, a second frequency reuse partitioning system and a second fixed frequency reuse system in said second one of said synchronized time slots.

19. A method according to Claim 17 wherein said step of allocating further comprises the step of allocating cellular radiotelephone frequencies among said plurality of base stations according to said first frequency allocation in a third one of said synchronized time slots to thereby adapt to increasing users of said first frequency allocation system.

20. A method for operating a plurality of code division multiple access cellular radiotelephone base stations for communicating with cellular radiotelephones using a plurality of spreading codes each of said spreading codes having a period, the method comprising the steps of:

allocating cellular radiotelephone frequencies among said plurality of base stations according to a first frequency allocation system for a first one of said spreading codes and according to a second frequency allocation system different from said first frequency allocation system for a second one of said spreading codes.

21. A method according to Claim 20 wherein said step of allocating is preceded by a step of synchronizing said plurality of spreading codes among said plurality of base stations so that said periods of  
5 said plurality of spreading codes are concurrent, to produce synchronized spreading codes among said plurality of base stations.

22. A method according to Claim 20 wherein said step of allocating comprises a step of allocating cellular radiotelephone frequencies among said plurality of base stations according to one of a first  
5 adaptive channel allocation system, a first frequency reuse system, a first frequency reuse partitioning system and a first fixed frequency reuse system for said first one of said synchronized spreading codes and according to one of a one of a second adaptive channel  
10 allocation system, a second frequency reuse system, a second frequency reuse partitioning system and a second fixed frequency reuse system for said second one of said synchronized spreading codes.

23. A cellular radiotelephone base station for a cellular radiotelephone cell which communicates with cellular radiotelephones using radiotelephone communications signals communicated over a plurality of  
5 sequential time slots using frequencies allocated to the base station for each time slot of the plurality of sequential time slots, the base station comprising:

first processing means responsive to a first type of radiotelephone communications signals  
10 communicated during a first group of sequential time slots of said plurality of sequential time slots, for processing said first type of radiotelephone communications signals to thereby recover radiotelephone communications; and

15               second processing means responsive to a  
second type of radiotelephone communications signals  
different from said first type of radiotelephone  
communications signals and communicated during a second  
group of time slots, for processing said second type of  
20   radiotelephone communications signals to thereby  
recover radiotelephone communications.

24. A base station according to Claim 23:  
wherein said first processing means comprises  
means for processing narrowband radiotelephone  
communications signals; and  
5               wherein said second processing means  
comprises means for processing wideband communications  
signals.

25. A base station according to Claim 24  
wherein said means for processing wideband  
communications signals comprises means for despread  
code division multiple access (CDMA) radiotelephone  
5   communications signals.

26. A base station according to Claim 23:  
wherein said first processing means comprises  
means for processing digital voice radiotelephone  
communications signals; and  
5               wherein said second processing means  
comprises means for processing packet data  
radiotelephone communications signals.

27. A base station according to Claim 26  
wherein said means for processing packet data  
radiotelephone communications signals comprises means  
for canceling interference.



28. A base station according to Claim 23 wherein said first and second processing means comprise:

5 receiving means, responsive to cellular radiotelephones, for receiving radiotelephone communications signals from a cellular radiotelephone over a plurality of signal paths; and  
means for processing radiotelephone communications signals received by said receiving  
10 means.

29. A base station according to Claim 28 wherein said means for processing radiotelephone communications signals comprises:

5 first means for combining the received radiotelephone communications signals which are received from a first direction; and  
second means for combining the received radiotelephone communications signals which are received from a second direction.